

EUROPEAN MATERIALS FORUM - LAUNCH MEETING

UNIVERSITY COLLEGE CORK 28th - 29th JUNE 2004

MINUTES OF THE MEETING

Welcome

Delegates were welcomed to the meeting by Professor Gerry Wrixon, President of University College Cork (UCC), who observed that Materials Science impacts on all industries, therefore is inevitably fragmented, of low profile, and in need of coordination. He believed that the European Materials Forum would, therefore, fulfil an essential role.

Professor Hermann Grimmeiss, President of the European Materials Research Society (E-MRS), added his welcome to the participants at the meeting. He reflected that E-MRS was founded in 1983 with the aim of bringing together the advanced materials scientific community in Europe, and he pledged its support to the Forum.

Introduction

In his introductory speech, Professor Gabriel Crean, Director of NMRC, Ireland's ICT Research Institute, referred to the Lisbon summit in 2000, which set Europe the target of becoming the most dynamic knowledge-based economy in the world by 2010. He stated that this will necessitate increased cooperation in all fields, including Materials, which scarcely has a voice in Europe, where it is often subsumed into other subjects. The idea of a European Materials Forum had been endorsed by delegates at the E-MRS Spring Meeting in Strasbourg. What is more, letters of support for its launch had been received from a number of MEPs, university directors, ministers of research, and other important people. These would be circulated with the minutes of the meeting.

Session I: Visions for European Research

The first session was chaired by Dr. Pär Omling, Director General of the Swedish Research Council, assisted by Professor Denis Weaire, Vice-President of Academia Europea.

It began with a presentation on behalf of Mr Noel Dempsey, Minister of Education and Science for Ireland, which was delivered by Dr. John Dennehy, Secretary General of the Department. This alluded to the decision of the Barcelona European Council in March 2002, which was approved in April 2003, to increase expenditure on research, development and innovation in the European Union from 1.9 % of GDP to 3 % GDP by 2010 to make Europe competitive with the USA and Japan. In Ireland, Science Foundation Ireland (SFI) was created in 2000 to advance cooperative efforts by education, government and industry. By 2006, the total investment by SFI will have reached 646 million Euros. Dr Dennehy reiterated the view that the visibility of Materials Science and Technology is low, even though the subject impacts on a wide range of industries. New materials, including nano-materials, smart materials, and biomimetic materials, will allow revolutionary developments to take place in coming decades. The European Materials Forum would play an important role in bringing materials into the public's consciousness.

The next presentation was from Professor José Mariano Gago, who had been the Minister for Research Policy in Portugal at the time of the Lisbon summit. He expressed concern that the target to see research expenditure in Europe increase to 3 % GDP by 2010 might not be met because of reductions of research budgets in some states, together with a shortage of research personnel. He believed, therefore, that the European Materials Forum (EMF) would be an important move in the right direction as far as materials is concerned. Knowledge is too scattered at present. In order to maintain a critical mass, new policies promoting basic science in Europe, such as the idea of a European Research Council, which has been mooted, would be essential in order to increase the budget on research and the attractiveness of careers in research. It would also be necessary for industry and the universities to join forces under a strong European science policy and he was confident that the EMF would facilitate this process.

The next message of support was from Professor Achilleas Mitsos, Director General of EC Research. He had provided a number of important documents relating to the future of science and technology in Europe, including a report that only two weeks ago, on 16th June, the Commission had proposed increasing its funding of research by more than a factor of two to an average of € 10 billion a year for the five-year duration of the Framework 7 Programme. This was in recognition of the fact that scientific development determines more than 50 % of European income. In doing this, the Commission's objectives are:

1. to create European Centres of Excellence;
2. to launch technological initiatives on a European scale;
3. to establish a European Agency to support basic research themes;
4. to make Europe more attractive to the best researchers in the world;
5. to develop research infrastructures in Europe;
6. to strengthen coordination between national and European research.

In addition, the management and financial provisions of the Framework Programmes are to be simplified on the basis of past experience.

The last message to be conveyed by Professor Van de Voorde was from Professor Roberto Cingolani, Scientific Advisor to the Minister for Research and to the President of CNR in Italy. He referred to the challenge posed by the complex globalisation of society, which affects materials research. There is now worldwide competition between the best centres of excellence in fields from which new technologies emerge as the result of interactions between these centres and industry. The research institutes in the individual European states are too small to sustain competition with North America, Eastern Asia, and other emerging parts of the world. Therefore, the efforts of the best members of the European Union must be combined to enable Europe to be among the world leaders in every important field. However, in Europe the knowledge and expertise in materials science is too diffuse and synergies between different countries are being lost. A new European vision is needed for materials science and research in the long term. Therefore, the European Materials Forum is refreshing and provides the key to our future welfare. It should address the long-term future of materials science in Europe.

These messages were followed by a presentation by Dr Miklos Boda, Secretary of State and Minister for Science in Hungary presenting a view point from the new European countries. He asserted that the addition of the ten new members had increased the number of scientists

in the European Union by 200,000. However, the countries in which they work are still in a 'catching-up' mode due to low expenditure on research to date, while the established countries, in general, are continuing to move ahead. The new member states now have access to large markets into which they will have the opportunity to enter and make their voices heard. Already things are improving and since 1996 the expenditure on research in Hungary has doubled. The number of patent applications increased from 694 in 1998 to 919 in 2001, and the nature of exports is changing from traditional items (e.g. meat products) to high technology products. Investment in research of up to 0.3 % of turnover by manufacturing companies is now being matched by support from the government and the mobility of researchers into industry is being encouraged. Hungary is already participating in various 6th Framework Programme projects and is keen to play a role in the European Materials Forum. He stated that participation in the European Materials Forum would be helpful to Hungary.

The final presentation in this session was by Dr Christoph Helm, State Secretary in the Brandenburg Ministry of Higher Education, Research and Culture. He discussed cooperation between regional, national and European levels of materials research and claimed that a transition is now taking place from the industrial society of the 19th and 20th centuries to a knowledge-based society for the 21st century. At the same time, globalisation means that Europe must evolve into a single zone with regard to education and research. The harmonisation of qualifications in European higher education will be completed by 2010 in Germany and will improve the mobility of both staff and students. Materials science research in Germany is organised federally, with 16 autonomous districts (Länder). There is a legal requirement for cooperation between the federal and regional governments, with joint funding of major institutes such as the Max Planck, Helmholtz, and Fraunhofer Institutes. Federal government collaborates with the Länder, making full use of available knowledge and this should be extended on a European basis because the field is still dominated by large American and Japanese organisations. Dr Helm suggested that the establishment of large scale research institutes in the 1960s and 1970s for nuclear technology provided a good example of how this might be done in other fields. He thought that the European Materials Forum could undertake a coordinating role for the whole of the economic community in its area.

In his closing comments, Dr Omling said that the session had set the scene: Europe must join competition with the USA, as does Japan, Korea and China. He stressed that at present, the Framework Programme represents only 5 % of European research expenditure; nationally-supported research continuing to be on a much larger scale. He supposed that the difficulty in organising research in the field of materials science is because of its cross-disciplinary nature, and believed that the European Materials Forum would facilitate matters. For his part, Professor Weaire believed that it is in the nature of the people attending the launch meeting to think big, and to wonder how to set up ever-larger organisations. However, in the USA people believe in personal freedom to innovate and he thought that both approaches are necessary.

Professor Van de Voorde wondered why materials science is not perceived as being an attractive subject in comparison with all other branches of science. Dr Omling stressed that a single strong voice is needed to promote materials science, rather than many diffuse messages. Professor Grimmeiss stated that materials science is different from all other topics and needs a different approach. Dr Omling thought that the European Materials Forum would be able to make the field appear more attractive to younger people. The final word went to Professor Robert Singer, Vice-President of the Federation of European Materials Societies

(FEMS) who emphasised that it is quite possible to make materials science appear an attractive subject, as shown by the brochure of the Siemens company and by the annual reports of the Helmholtz, Fraunhofer and Max Planck Institutes. It will be up to the European Materials Forum to spread the message to young people throughout Europe.

Session II: European Initiatives

This session was co-chaired by Professor Leopoldo Guimarães, Rector of the University of Lisbon (representing Ms. Maria da Graça Carvalho, the Minister of Science and Higher Education, Portugal) and Professor van de Voorde of the University of Technology, Delft.

The first presentation, by Dr Peter Tindemans, Convenor of Science Policy, The Netherlands, discussed the place of fundamental research in Europe. This stressed the need for more imaginative solutions (not just money) to solve the problems faced by basic science in Europe. Basic research is a source of opportunities because it leads to new technologies, as well as being a source of diversity, and it produces people who can absorb knowledge from the world stock. It requires strong universities, large facilities, competition, scale and scope. In Europe we are complacent about transferring our knowledge into practice and as a consequence are losing out in terms of Nobel Prizes and find it hard to attract top scientists from the United States. The Shanghai Ranking of Universities (<http://ed.sjtu.edu.cn/ranking.htm>) shows that 15 out of the top 20 universities worldwide are in the USA, with only four from Europe and one from Japan. Lessons learned from the USA should be applied in Europe. In Europe the need for basic research is queried, whereas in the USA it is funded because of its valued contribution to prosperity and health. Expenditure on large facilities in Europe is only one-half that in the USA. To rectify matters, we need:

- more differentiation in quality and mission between different European universities (i.e. whether teaching or research based);
- an independent European Research Council (not just an evaluation panel for the Framework Programmes);
- large fora with specific, defined targets;
- road maps listing large facilities ranked in terms of maturity, importance, etc., and a programme for building new facilities.

Dr Tindemans recognised the widespread and vital importance of materials science, not just in connection with information and communications technology, and the nano- and bio-sciences. He believed that the European Materials Forum would have an important role to play in setting things up institutionally.

Bertil Andersson, CEO of the European Science Foundation (ESF) spoke next, on mechanisms of basic research. He explained that ESF is based in Strasbourg and Brussels, has 75 members (mostly institutions, of which 5 were present at the EMF Launch Meeting). ESF runs the COST Office in Brussels and is a pro-active player in the European Research Area. It networks by looking at the future of science. Dr Andersson stated that the USA is usually 3-5 years ahead of Europe because of its ability to apply cutting-edge science with a short return time, and he expounded the view that there are only two types of science: applied science and nearly applied science. In Europe, the EC has traditionally provided only 5 % of the funding for research, with 60 % of the total coming from national sources. National funding is generally independent, with a proven track record, but tends to be fragmented and to lack an overall strategy, which can lead to the underfunding of projects. On the other hand, EC funding provides new money and mobility and strives to avoid fragmentation. However, the EC cannot give grants, just complicated contracts, and there is a need for a grant system

at a European level. In Dr Andersson's view, Europe needs a research council to support basic research on a pan-European level. However, the original concept of a European Research Council has mutated into a European Research Competition, a sort of champions' league for science in which the best scientists can compete. Dr Andersson welcomed this development but stressed the need for the ERC to be at arm's length from the EC, governed by the scientific community and run by 30 elected scientists who would go for scientific excellence only, and issuing grants, not contracts. He stated that the European Materials Forum could help to convince the new European Commission, Finance Ministers and others on these points.

There followed a joint presentation on "Material Research in the EARTO Organisation" by Dr Hendrik Schlesing, Secretary General of EARTO (the European Trade Association of Research and Technology Organisations) in Belgium, and Dr Unni Steinsmo, Vice-President of Research for SINTEF, Norway. Dr Schlesing explained how research and technology organisations link science and industry and have an annual turnover of € 6 billion. They depend on cooperation between all partners, including industry, universities, national research organisations, etc. He believed that the need exists for a body to coordinate the role of materials scientists and provide the necessary cooperation in this area. He looked to the EMF to undertake this role on behalf of the materials field. Dr Steinsmo then expounded on the methodology and importance of applied research, emphasising the view that R&D results provide the raw material that leads to increased industrial production.

"Synergy and Promotion of National and European Research" was the theme of a contribution by Dr Edward M. Walsh, Chairman of the Irish Council for Science, Technology and Innovation, that was presented by Professor Anita Maguire, a member of the Irish Research Council. Professor Maguire explained that the ICSTI provides strategic focus to research in Ireland. The last year has seen an improvement in the outlook for research over the preceding five years. There was a doubling of funding for research in Ireland between 1997 and 2003. Biology and ICT are well-represented, with related support for materials research, underpinned by support of basic research.

Professor Krzysztof J. Kurzydłowski, Deputy Chairman of the State Committee for Scientific Research in Poland discussed the needs for a European strategy, as seen from a new member state. He described the well-organised research structure in Poland, based on the State Committee for Scientific Research. This conducts detailed evaluations of each Polish institution every 4 years for ranking purposes. Education is gaining in importance and between 1991 and 2003, the number of university students rose from 385,000 to 1,800,000 (up from 13 % to 43 % of the eligible age group). Poland has a well-organised system of state research funding and networks in materials. There are seven National Projects involving people from various groups on subjects of national interest such as New Technologies for Manufacturing Nano-structured Metals and Alloys, Polymer Materials Modified by Nano-Particles: Technology/Properties/Applications, and New Materials and Technologies for Biomedical Applications. An important objective of Poland has been participation, as an associate member, in the EU's 6th Framework Programme. It succeeded in winning support for a Network of Excellence on multifunctional materials, which involves 18 universities and 22 companies. The areas in which Professor Kurzydłowski feels that coordinated European action will be most important include the mobilisation of human resources and the participation of industry in research.

The final presentation in this session was by Professor Helmut Dosch, Member of the Helmholtz Association (HGF) and Director of the Max-Planck-Institute, Stuttgart, Germany. He addressed the needs for, and importance of, cooperation in materials science research within Europe. This is a highly interconnected field in which the necessary technologies are sophisticated, dedicated, and expensive. Because of fragmentation within Europe there is insufficient cross-talk between the communities involved. Well-managed collaboration is needed on a European scale to address the interdisciplinarity of the research field. It needs much more funding in Europe, and must have a strong revolutionary aspect. It is an enabling technology, without which there will be no new technology (e.g. in the fields of medical science or space technology). At present there is:

- underfunding of fundamental research;
- fragmentation of effort;
- the need for a careful balance between competition and networking;
- underusage of the research infrastructure;
- unclear career progression in research;
- excessive bureaucracy in the EC.

The European Materials Forum will have a big task to create the necessary awareness in Europe, and thorough analysis will be needed before recommendations are made to the policy makers. Professor Dosch believes that the Forum is very much needed and feels that it should really have been started 25 years ago. However, the future is bright if we take action now.

During discussion, Professor Grimmeiss declared himself impressed by what he had heard. He felt that the statements should be accessible by a wider community and he requested that the speakers should provide their texts for subsequent publication. He shared peoples' concern about the dwindling number of Nobel Prize winners from Europe, but took consolation in the fact that 21 % of the USA laureates were from Europe in the first place.

Professor Singer expressed gratitude to Professor Dosch for pointing out the importance of materials science research. A study in Bavaria had shown that two-thirds of both jobs and the Gross Domestic Product are founded on materials science.

Professor Dosch suggested that in view of the large amount of work that needs to be done, the Forum would need at least two working groups. Dr Tindemans observed that the promotion of innovation is usually done at a national, rather than European level, and that the support provided by the nations is much greater than the 5 % spent at an international level.

In response to a query about how the Forum would gain support for materials science research, it was suggested that the topic must be made more attractive. One way would be by presenting it properly in secondary schools. Although the emphasis is different in different countries, most pupils leave school without any knowledge of materials science. Therefore, attention should be given to attracting both young people and money to the field.

Another question related to the comment by Dr Tindemans that more centres should be built. Dr Tindemans responded by suggesting that industrial concerns should be encouraged to attach their names to research centres. He thinks that in Europe at present too much effort is spent on coordination and building up networks. These do not address shortages in certain areas and if people can master the required skills in one place, networks are unnecessary. In his view, more large-scale facilities are needed in Europe and this point should be discussed in the Forum.

Session III: Materials Science Visions for 2020

This session was chaired by Mr Ioannis A. Tsoukalas, General Secretary for Research and Technology, Greece.

An introductory talk by Dr Emmanuel Floratos, Director of DEMOKRITOS in Athens, an establishment accommodating 8 institutes employing a total of 1200 staff, concerned the importance of the European Materials Forum from a national standpoint. He illustrated the benefits of large research centres by reference to CERN, the European organisation for nuclear research. It was founded in 1954 by 12 member states and is located on the French-Swiss border near Geneva. It employs the world's largest scientific instruments to study particle collisions. At present, 500 institutes from 8 countries participate in its work and 6500 researchers participate to bring important benefits to society from information about solids, liquids and gases. The running costs amount to 1 billion Swiss Francs per year, but the return to investors amounts to 30 %. The largest accelerator, over 27 km long, generates 800 million particle collisions per second. CERN is a valuable training ground for young scientists and among its inventions have been positron emission tomography and the world wide web, which was developed in response to its growing communication needs. What Europe needs now are large materials science research centres and this should be an aim of the European Materials Forum.

Following this introduction, selected viewpoints were presented from eleven members of the European research community.

The first of these, on behalf of the European Space Agency was to have been given by Marc Heppener but, in his absence, was given by Dr David Jarvis, the Materials Science Coordinator of the Agency's Directorate of Human Space Flight. This focussed on microgravity research and discussed facilities in the Materials Science Laboratory on the European Space Station for the study of containerless processing using electromagnetic levitation. Forty European companies participate in this research and there is collaboration with China, Japan and USA. Intermetallic materials processing is now being studied in relation to solidification processes both on earth and in space.

The next message was presented by Dr Christoph Leyens, Director of the Institute of Materials Research at the German Aerospace Centre. He explained that aerospace research is highly diversified and spread over the whole of Europe. Conventional materials will be of prime importance for the next 20 years or so. There are three main research topics:

- High temperature materials for propulsion systems (metals, coatings, MMCs and composites);
- Lightweight structures (composites, hybrid materials, integral light metal structures for aircraft and aero-engines);
- Nanotechnology for aerospace applications (including coatings).

Carbon fibre reinforced composites are already used extensively in the A380 Airbus structure, but metal matrix composites cannot yet be applied. It is considered that activities in materials science and technology must be better coordinated for Europe to establish itself as the undisputed world leader in the field. Therefore, the European Materials Forum will play an important role.

Dr Bernard Barbier of the European Micro and Nano Technologies Research Alliance (France) spoke next. He explained that a French nanotechnology network has been

established with four main centres at Lille, Paris, Toulouse and Grenoble, with a budget of € 140 million over 5 years to develop new materials for electronic and memory system applications. The next development will be the LETI-MINATEC Innovation Centre in Grenoble. This will be operational in 2005, as a cost of € 450 million, and will employ 4000 persons. Professor Van de Voorde asked why there is to be no European Centre, involving other countries such as Switzerland, Belgium, Ireland, etc. Dr Barbier explained that competition between different laboratories must be maintained. Therefore, in this case, a unique European centre would not be a good thing. He referred to the fact that in the USA there is more than one large centre. However, he acknowledged the need for a European Network of Excellence on Materials for Nanoelectronics.

The viewpoint of the European Council for Automotive R&D (EUCAR) was expressed next by Dr Ulf Palmquist (Sweden). EUCAR involves Fiat, Volvo, BMW, Opel, VW, DaimlerChrysler, Ford, Porsche, PSA (Peugeot/Citroen), and Renault. It was formed in 1994 as the successor to the Joint Research Committee. It has 10 different working groups split between system integration groups and enabling technology groups (including a Materials group). Each group contains experts from the ten member companies. There is no central budget, but there is participation in European Programmes. Materials have always had a central role in aspects such as: active materials; nanotechnologies; net shape engineering; closed loop simulation; advanced assembly/dismantling processes and new joining techniques; low-cost high performance materials; and high performance manufacturing. By 2015 it is anticipated that there will be touch-sensitive plastics. In the Framework 6 Programme there are three large projects, concerned with: Fuels and Power Trains; Materials Processes and Manufacturing; and Integrated Safety. The first of these involves materials research, e.g. on hydrogen storage for fuel cells, and for the super-light car, which aims at a 30 % weight reduction together with advanced crash performance and recyclability. There is also a 3rd millennium car project, where the structure is in three parts, front, middle and rear. Collaboration is regarded as very important to EUCAR, including the exchange of researchers. It would like to collaborate with the European Materials Forum but this must be in association with others for solving things as a kind of partnership between industry and academia.

Enterprise Ireland was represented by Mr T J Hughes, Technical Operations Manager for Materials Ireland, based in Glasnevin, Dublin. Enterprise Ireland represents 3000 Irish companies and aims to accelerate their growth with regard to sales and export potentials by helping to bridge the gap between academia and industry. In Ireland materials research goes on in 13 universities and institutes whose staff are involved in ten different networks. By 2020, new materials with industrially exploitable properties together with environmental benefits must be developed and integrated into manufacturing. This will require an interdisciplinary approach.

Dr Per Eriksson represented VINNOVA, the Swedish Agency for Innovation Systems. VINNOVA promotes sustainable growth by funding universities. Research funding in Sweden is already in excess of 3 % GDP, but the country is not strong in research institutes and economic growth resulting from research needs to be more profitable. Centres of excellence at universities are funded one-third each by VINNOVA, the university, and industry. In the materials science field a programme on Materials Design, including nano-materials is planned. Dr Eriksson expressed support for the European Materials Forum, but stressed the need for industry to be strongly involved in the Forum.

The Vice-President of the Federation of European Materials Societies (FEMS), Professor Robert Singer of the Friedrich-Alexander-Universität Erlangen-Nürnberg, presented a FEMS perspective for the EMF. Well over 50 % of the 25,000 or so people who belong to FEMS Member Societies come from industry, including SMEs. FEMS believes that the main goals of the European Materials Forum should be to meet the challenge from the USA and Japan; act as a partner to the European Commission and formulate and express the opinions of the materials community.

The Forum could help to link academia and industry and increase the visibility of Materials Science. It could also help to define future research topics (e.g. what comes after nano- and bio- technologies) and to explore the full potential of today's existing materials. The Forum could also seek to improve present funding arrangements in order to increase success rates of proposals to well above the current 5-10 % level; form smaller, more manageable groups; select strategic topics and define them clearly; allow for a bottom-up (investigation-driven) approach; re-define the size limit of SMEs (to > 250 employees); strive for quality, irrespective of the goal; increase the focus on basic research; replace networks by centres of excellence.

It was emphasised that specific actions for the Forum in the immediate future should be to formulate the statutes; define a structure (possibly two-tiered, with working groups and plenaries); build a database of key materials scientists in Europe from which to identify authoritative participants. FEMS, as a founder member, would keen to participate in all of these activities, and more, in order to ensure rapid progress in the establishment of the European Materials Forum.

Following this presentation, it was reported that a letter of strong support for the foundation of the European Materials Forum had been received from Professor Hans Rudolf Ott, Chairman of the Condensed Matter Division of the European Physical Society, which had also agreed to be a founder member of the Forum (see attached)

The Vice-President of the European Materials Research Society, Dr. Abdelilah Slaoui of Centre National de la Recherche Scientifique (CNRS), Strasbourg, then explained that the main focus of E-MRS is on materials for electronics, energy, and health, and on materials diagnostics and characterisation. Its plan for the future includes the following:

1. Prepare materials science and technology road maps on important topics;
2. Establish virtual European laboratories;
3. Develop European Centres of Excellence in important areas;
4. Support fundamental research;
5. Achieve better integration between national and European research (a difficult task because France and Germany have already established their own centres);
6. Make education in materials science more attractive;
7. Contribute to the social acceptance of materials science.

The E-MRS view, as founder member of EMF and sponsor of this meeting, is that the European Materials Forum is needed to provide a linking framework for all materials-based technology activity within the European Community, to provide a means for the EU to interface with networks, and to stimulate both young scientists and materials-based technologies.

Finally, in this session, Dr Martin Hynes, Director of the Irish Research Council for Science, Engineering and Technology (IRCSET) discussed the work of his organisation. With a budget of € 15 million per annum it acts as an independent, autonomous, body funded by the Minister of Education and Science. This currently provides support for 500 post-graduate

studentships (about one-third of the total for all disciplines), 77 post-doctoral fellowships and 103 basic research grants. Ireland is still producing fewer PhDs than is desirable, although expenditure on research is increasing from 1.4 % GDP to close to the 3 % GDP target. About 9 % of IRCSET's budget goes to the support of materials-related research (mainly to do with nanotechnology). With this background, IRCSET welcomes the establishment of the European Materials Forum.

At this point, an extra presentation by Professor Igor Emri of the University of Ljubljana, Slovenia, was added to the session. Professor Emri coordinates the National Technology Network on Intelligent Polymeric Materials and Technologies, and he spoke about the Role of Materials in Sustainable Development, which he defined as “paying more to have less but being happy”. However, there are problems: while Slovenia is good in basic science, it is poor at converting knowledge into useful products. In order to bring the level of expenditure on research in Slovenia up to the European average, it will be necessary to invest 5 % GDP into research each year until 2011.

Session IV: Crafting the “European Materials Forum”

This final session took the form of a panel presentation and discussion chaired by Professor G. Crean, Director of NMRC, Ireland. The aim was to establish an action plan to take the Forum forward following its official launch.

1. General Vision and Objectives

The general vision and objectives of the Forum were set out by Professor Grimmeiss, President of E-MRS, who stressed the need for European Research Activity to be organised and focussed. The vision is of an organisation to stimulate, foster and promote education, research and innovation in materials science and technology. A general objective is to provide assistance for decision-making in the field of materials science and technology in Europe. In addition, there are ten specific objectives, as outlined below (with elaboration in brackets, where appropriate):

1. To represent European materials science and technology across the public and private sectors in order to stimulate synergy and to provide coherence in European Materials Science (e.g. more efficient returns for investment);
2. To provide the authoritative and influential voice of the materials science and technology community in Europe, leveraging its diversified but strong base (e.g. promotion of the interests of the materials science community);
3. To stimulate and foster coordination of European materials research and science policy for the benefit of the European Union to accelerate progress towards a truly European Research Area;
4. To be at the disposal of national and European authorities for the prosperity of the European Union (e.g. to strengthen European competitiveness with respect to the European Research Competition or other scientific funding agency);
5. To provide appropriate expert advice to assist in the structuring of the European materials science and technology landscape by taking into account the European enlargement (taking into account the different facets and cultures of the many key players, balancing basic and applied materials research to establish an unbroken chain between innovative ideas and new products);

6. To provide materials science and technology road maps in key strategic areas in order to focus European efforts for global competitive advantage (the road maps must be continuously updated as a prerequisite for economic competitiveness but this is more challenging than in many other fields and therefore requires the European Materials Forum);
7. To stimulate education and training initiatives (including e-learning) in materials science and technology to provide the future workforce for a knowledge-based Europe (an investment for the future that must not be neglected);
8. To attract young people and disseminate materials science to ensure its acceptance amongst the broader public (awareness of materials science must be approved);
9. To encourage partnerships, both intra- and inter-sectorally (a new European approach is expected to encourage partnership (not competition) to concentrate the assembled forces of all European materials science societies).
10. To flagship European materials science and technology at an international level (eventually leading to the possibility of a European Materials Science Nobel Prize).

2. Towards a European Materials Forum: Reflections on Strategy, Action Plan, Organisation and Future Impact

Professor Van de Voorde emphasised the need for the Forum to be a strong body to ensure that people take notice of it. He reflected on the following points:

1. In the 1960s the defence, nuclear and aerospace industries were important;
2. Over the last 20 years it is only communications that has moved forwards; materials has been dormant (however, with the expansion of the EU there will be new commissioners and D.G.s from the new countries with a positive outlook so expenditure on research should increase very significantly);
3. In the next 10 years there will be a research revival with the doubling of expenditure in the next Framework Programme.

The main question is: how will the money be spent? This is where the Forum will be of fundamental importance in the materials field by assisting in the definition of what the programme should be and where the priorities lie. At present, the materials field is in pretty bad shape and has low priority in many countries, so care will be needed to ensure that it is not decimated. An agency will appear that must install forums in areas such as biology, aeronautics, information science and, if one is ready, on materials (including physics, chemistry, etc.).

The European Materials Forum could provide the link but will need a strong council composed of valuable people who are able to do the job. For this, people are needed who have authority in the fields of policy-making, research, academia and industry.

In addition to the council, a coordination group will also be needed. A strong secretariat is also important. Professor Paul Siffert had already been appointed, who provides the secretariat to E-MRS to this position.

A suggested agenda for the immediate future was proposed as follows:

1. the minutes and other documentation relating to the launch meeting will be produced;
2. the layout of critical task forces will be decided;

3. a description of the Forum will be prepared for publication in “Nature”;
4. after August/September 2004, panels and structures will be set up;
5. an approach will be made to the 7th Framework Programme to obtain money from the Commission so that another meeting can be arranged at the end of the year.

Final Panel Discussion

The final discussion was heralded as the most important part of the meeting since it was expected to establish how the statutes of the Forum would be developed. The panel, chaired by Professor Crean, represented the kind of mix needed in the Forum which will only be as credible as its membership. It included: Mr Neil Williams, Head of the Physical and Engineering Sciences Unit at the European Science Foundation (who was representing Professor Andersson); Dr Boda; Professor Roger DeKeersmaecker, Vice-President Strategic Partnerships, Interuniversity MicroElectronics Centre, Belgium; Professor Guimarães; Professor Kurzydłowski; and Dr Tindemans.

The first questioner, a representative of the motor industry in Austria, asked what industry could expect to get out of the Forum (as opposed to what industry can give to the Forum). This point was taken up by Peter Tindemans who explained that the Forum will provide a policy outlet of the various interest groups within European materials science with respect to education, training and other aspects. It will provide a ‘voice’ for materials science, for example in providing a coordinated view of what should be supported in the 7th Framework Programme. Roger DeKeersmaecker emphasised the need for good communication between industry and the research community to ensure that what the Forum achieves matches industry’s requirements. Krzysztof Kurzydłowski added that education is important for industry as well as academia and that a more coherent approach to education is needed in Europe.

The next question came from a representative of a traditional industry in The Netherlands. She queried the need for new materials and expressed the view that what is really needed is new, reliable, data on traditional materials so that modern computer programmes on welding and solidification can be used. Peter Tindemans advised that European industry should make the transition to new materials and technologies as soon as possible.

Unni Steinsmo from SINTEF Applied Chemistry (Norway) supported the need for the Forum but stressed that it must focus on the interface between academia, industry and applied science. She asked how the different perspectives between the three groups would be accommodated. Denis Weaire addressed this point, stating that Marcel Van de Voorde had already provided the answer when he said that exceptional people are needed for the Forum. Such people are capable of bridging the gap between industry and academia and must be found. He went on to urge that the practical issues facing the forum must now be addressed. For instance, how do you make it worth the while for captains of industry to sit on the Forum, and how do you legitimise the process? He warned that although the Forum now has wide support, this would only last as long as things were progressing satisfactorily. The objectives are laudible, but the Forum must be set up to give advice with authority, without having to deal with numerous different national agencies. Its advice must be seen to be independent as well as authoritative or it will be ignored. The question to be answered is how to set up the Forum with authority.

Peter Tindemans stressed that the legitimacy of the Forum must be derived from the common voice of the materials science societies. He suggested that the societies must form an assembly to appoint a committee of 10-15 people from industry and other bodies to do the job.

Gabriel Crean suggested that talented people would only become involved if there were something very challenging to attract them. He also emphasised the need to secure the involvement of the new EU member countries.

Martin Hynes observed that the agencies would get involved if they see that this would help them to achieve their own vision, and went on to suggest that iconoclasts from industry should be sought and persuaded to participate.

Neil Williams added that the European Science Foundation feels strongly that the Forum must develop a system that national agencies will recognise and trust because the need is for independent, authoritative, advice from a single body.

Marcel Van de Voorde stated that it would be beneficial for the Forum to include good people from the ESF. He also observed that EuroForum had gained both recognition and monetary support from the European Union. If the European Materials Forum were also to gain recognition it might also receive financial support (which would solve many problems), and be asked to provide top advice to programme and advisory committees at both national and European levels. This highlighted the need for the Forum to be set up in such a way that it is recognised in the right places and at the right time.

In drawing the proceedings to a close, the Chairman gave an undertaking that a website will be established on which all of the presentations and speeches made during the official launch meeting of the ERM would appear, and where suggestions for the statutes of the Forum would be openly sought.

Finally, the official launch ceremony of the European Materials Forum took place, which was addressed by a representative from the Dutch Ministry for Education, Culture and Science. He endorsed the Forum and its objectives, as presented in the final session. He stated that materials science is not regarded as a high priority in The Netherlands. However, that does not mean that it is unimportant, just that it is encompassed by other disciplines. He suggested that, with the change in the European Presidency from Ireland to The Netherlands about to take place, it would be appropriate for the next gathering of the Forum to be held in The Netherlands, and he invited the current ad-hoc EMF Committee to make the arrangements.

Paul McIntyre
FEMS Secretary
28 July 2004